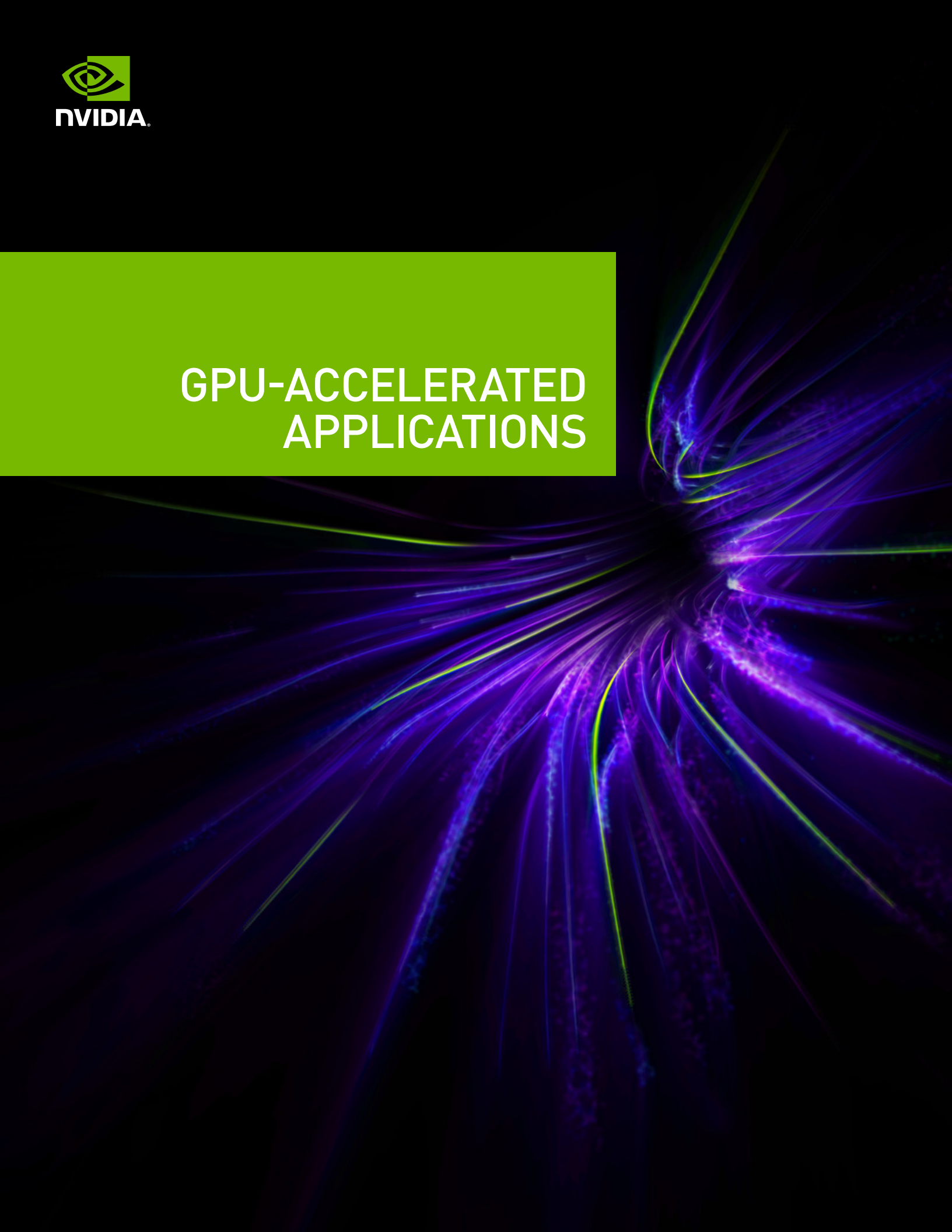
NVIDIA
GPU-ACCELERATED
APPLICATIONS

GPU-ACCELERATED APPLICATIONS

Accelerated computing has revolutionized a broad range of industries with over four hundred applications optimized for GPUs to help you accelerate your work.

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Computational Finance

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Aon Benfield Pathwise ™	Specialized platform for real-time hedging, valuation, pricing and risk management	Spreadsheet-like modeling interfaces, Python-based scripting environment and Grid middleware	Yes
Altimesh's Hybridizer C#	Multi-target C# framework for data parallel computing.	C# with translation to GPU or Multi-Core Xeon	Yes
Elsen Accelerated Computing Engine (TM)	Secure, accessible, and accelerated back-testing, scenario analysis, risk analytics and real-time trading designed for easy integration and rapid development.	Web-like API with Native bindings for Python, R, Scala, C. Custom models and data streams are easy to add.	Yes
Global Valuation Esther	In-memory risk analytics system for OTC portfolios with a particular focus on XVA metrics and balance sheet simulations.	High quality models not admitting closed form solutions, efficient solvers based on full matrix linear algebra powered by GPUs and Monte Carlo algorithms.	Yes
Hanweck Associates	Real-time options analytical engine (Volera)	Real-time options analytics engine	Yes
MiAccLib 2.0.1	Accelerated libraries which encompasses high speed multi-algorithm search engines, data security engine and also video analytics engines for text processing, encryption/ decryption and video surveillance respectively.	Text Processing : Exact Match, Approximate\Similarity Text, Wild Card, MultiKeyword and MultiColumnMultiKeyword, etc Data Security: Accelerated Encryption/ Description for AES-128 Vide Analytics: Accelerated Intrusion Detection Algorithm	Yes
MISYS Global Risk	Regulatory compliance and enterprise wide risk transparency package.	Risk analytics	Yes
Murex MACS Analytics Library	Analytics library for modeling valuation and risk for derivatives across multiple asset classes.	Market standard models for all asset classes paired with the most efficient resolution methods (Monte Carlo simulations and Partial Differential Equations)	Yes
Numerical Algorithms Group (NAG)	Random number generators, Brownian bridges, and PDE solvers.	Monte Carlo and PDE solvers	Single only
* **Numerix**	Numerix introduced GPU support for Forward Monte Carlo simulation for Capital Markets and Insurance.	Equity/FX basket models with Black-Scholes/Local Vol models for individual equities and FX, Algorithms: AAD (Automatic Algebraic Differential) New approaches to AAD to reduce time to market for fast Price Greeks and XVA Greeks	Yes
QuantAlea's Alea.cuBase F#	F# package enabling a growing set of F# capability to run on a GPU	F# for GPU accelerators	Yes
RMS	Catastrophic risk modeling for FSI (earthquakes, hurricanes, terrorism, infectuous diseases)	Risk analytics	Yes
SciComp, Inc	Derivative pricing (SciFinance)	Monte Carlo and PDE pricing models	Single only
SunGard- Adaptiv Analytics	A flexible and extensible engine for fast calculations of a wide variety of pricing and risk measures on a broad range of asset classes and derivatives.	Existing models code in C# supported transparently, with minimal code changes, Supports multiple backends including CUDA and OpenCL, Switches transparently between multiple GPUs and CPUS depending on the deal support and load factors.	Yes
Synerscope- Synerscope Data Visualization	Visual big data exploration and insight tools	Graphical exploration of large network datasets including geo-spatial and temporal components.	Single only
Xcelerit SDK	Software Development Kit (SDK) to boost the performance of Financial applications (e.g. Monte-Carlo, Finite-difference) with minimum changes to existing code.	C++ programming language, cross-platform (back-end generates CUDA and optimized CPU code), supports Windows and Linux operating systems.	Yes

* Indicates new application

Climate, Weather and Ocean Modeling

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
ACME-Atmosphere	Global atmospheric component model for ACME global coupled climate model	Dynamics only	Yes
COSMO	Regional numerical weather prediction and climate model	Radiation only	Yes
* **GALES**	Regional numerical weather prediction model	Full model	Yes

Data Science & Analytics

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
* **Altair PBS Professional®**	Workload management software	HPC & data center management	Yes
BIDMach	The fastest machine learning library available. Holds the record for many common macine learning algortihms. Both BIDMach and its sister library BIDmat were originated at UC Berkley.	Written in Scala and supports Scala and Java interfaces. Supports linear regression, logistic regression, SVM, LDA, K-Means and other operations.	Yes
* **BlazingDB**	GPU-accelerated relational database for data warehousing scenarios available for AWS and on-premise deployment.	Modern data warehousing application supporting petabyte scale applications.	Yes
Blazegraph	The first and fastest GPU-accelerated platform for graph analytics. It provides high-level graph database APIs with transparent GPU acceleration for graph query. It delivers graph analytics at over 32 billion traversed edges per second.	Support for RDF/SPARQL APIs and Tinkerpop/Blueprints stack. Scala-based graph analytic and machine learning application language. Ease of integration into Spark and Hadoop. Support for GPU cluster deployment.	Yes
* **Capio**	In-house and Cloud-based Speech Recognition technologies	Real-time and offline (batch) speech recognition, Exceptional accuracy for transcription of conversational speech, Continuous Learning (System becomes more accurate as more data is pushed to the platform)	Yes
* **Datalogue**	Deep learning powered pipelines that automatically ingest data in any format from any source, delivering ready to use data for enterprise analytics, BI and data governance workflows.	Automated ontology mapping and detection (including PII and other types of sensitive information); Field standardization; Semi-structured field parsing.	Yes
* **Deepgram**	Deepgram increases your company's revenue by analyzing your audio data. We use AI to transcribe, spot keywords, and get insights from phone calls, video footage, and online media.	Keyword and phrase search, Speech transcription, Speech analytics for compliance, Topic modeling	Yes
* **Graphistry**	The fastest graph visualization and analysis solution for very large amount data. Graphistry is able to present millions of events on a graph within seconds.	Able to show billions of individual connections. Support for CVS, Sprak and Splunk.	Yes
* **Gridspace**	Voice analytics to turn your streaming speech audio into useful data and service metrics. Instrument your contact / call center and work communications today with powerful deep learning-driven voice analytics	Speech-to-text transcription, Compliance, Call grading, Call topic modelling, Customer service enhancement, Customer churn prediction	Yes
Gunrock	Gunrock is a library for graph processing on the GPU. Gunrock achieves a balance between performance and expressiveness by coupling high performance GPU implementations with a high-level programming model, that requires minimal GPU programming knowledge.	Direction-optimizing BFS, SSSP, PageRank, Connected Components, Betweenness-centrality	Yes

* Indicates new application

*	**Intelligent Voice**	Intelligent Voice takes your company's phone calls (and email and IM) and turns them into smart data using World's Fastest Speech to Text Engine	Keyword and phrase search, Speech transcription, Speech analytics for compliance, Topic modeling	Yes
	Jedox	Helps with portfolio analysis, management consolidation, liquidity controlling, cash flow statements, profit center accounting, treasury management, customer value analysis and many more applications, all accessible in a powerful web and mobile application or Excel environment.	This database holds all relevant data in GPU memory and is thus an ideal application to utilize the Tesla K40's 12 GB on-board RAM. Scale that up with multiple GPUs and keep close to 100 GB of compressed data in GPU memory on a single server system for fast analysis, reporting and planning.	Yes
	Kinetica	In-memory relational database build to leverage the power of GPUs and to precess massive amount of data extremely fast. Full suite of geospacial application capabilities.	Query against Big Data in real time. SQL support. No pre-indexing allows for complex, ad-hoc query chains. Interactively explore large, streaming data sets.	Yes
	MapD Technologies	MapD is a GPU-powered data exploration platform that combines a database and visual analytics platform to deliver millisecond performance for at-scale data challenges that run to the billions of rows. With speeds-ups of 100x to 1,000x than even the fastest CPU-powered solutions organizations can tackle problems that were previously considered too large, complex or lengthy.	MapD in-memory, column store, relational database supports standard SQL queries and was built from the ground up to take advantage of the parallelism of GPUs. Similarly, the Immerse visual analytics front-end takes advantage of the GPU in novel ways to render billions of rows with millisecond latency – even across challenging tasks such as point maps.	Yes
*	**PolyAnalyst**	General purpose corporate-level data & text mining system. Great set of data exploration methods for solution of wide range of data analysis problems. Primarly targeted at work with big data from retail, banking, insurance, manufacturing and other data-rich business domains.	Practically all popular data analysis algorithms are implemented. Decision tree, naive bayes, SVM, neural networks, logistic regression, bagging and boosting methods, linear and non-linear regression, various methods for time series analysis, k-means, density-based clustering, Kohonen maps, factor analysis, and many others. GPU cluster support is planned in next versions.	Yes
*	**Polymatica**	Business analytics platform for fast analytical processing of Big Data using Data Mining algorithms and Machine Learning methods. Polymatica is built on OLAP-in-GPU-memory technologies with full support of GPU acceleration in OLAP ad-hoc operations and Data Mining calculations.	OLAP, Business Intelligence, Data Discovery, Data Mining, Multidimensional data analysis, Visual analytical work, Interactive dashboards.	Yes
	Sqream DB	GPU accelerated SQL database engine for big data analytics. Sqream speeds SQL analytics by 100X by translating SQL queries into highly parallel algorithms run on the GPU.	Up to 100TB of raw data can be stored and queried in a standard 2U server. Inserts and analyzes hundreds of billions of records in seconds. No indexes required. No changes to SQL code or data science paradigms required.	Yes
*	**SynerScope**	Big data visualization and data discovery platform for data analytics, cyber public sector and on IoT scenarios	Real-time Interaction with data	Yes
*	**Tanay ZX Lib (Fuzzy Logic)**	Financial analytics and data mining library	Monte Carlo simulations, pricing of vanilla and exotic options, fixed income analytics, data mining.	Yes

* Indicates new application

Deep Learning and Machine Learning

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
ANACONDA	Anaconda is the leading Open Data Science platform powered by Python, the fastest growing data science language. It is a free, high-performance Python & R distribution with 1000+ curated packages.	Anaconda has been downloaded over 15M times and is used for AI & ML data science workloads using TensorFlow, Theano, Keras, Caffe, Neon,Lasagne,NLTK, spaCY. Anaconda's Numba is a revolutionary Python-to-GPU compiler that compiles easy-to-read Python code to many-core and GPU architectures. Also includes single-line install of key deep learning packages for GPUs.	Yes - For Deep Learning Packages and Numba
ANACONDA Enterprise	Anaconda Enterprise takes Anaconda to the next level and makes it easy, secure, and manageable to scale powerful analytics workflows from the laptop to the server and then scaled out to your cluster, while also incorporating collaboration, publishing, security, and Hadoop-optimized deployment.	Anaconda Enterprise opens up the full capabilities of your GPU or multi-core processor to the Python programming language. Common operations like linear algebra, random number generation, FFT and Monte Carlo simulation run faster, and take advantage of multiple cores. Identify and remedy performance bottlenecks easily with data, code and in-notebook profilers. Includes Bindings to CUDA libraries: cuBLAS, cuFFT, cuSPARSE, cuRAND, and sorting algorithms from the CUB and Modern GPU libraries.	Yes
BidMach	GPU-accelerated classical machine learning library	Logistic regression, SVM, LDA, SFA, NMF, ICA, random forests, clustering, word2vec	Yes
* **Bons.ai**	Bons.ai is an artificial intelligence platform which abstracts away the low-level, inner workings of machine learning systems to empower more developers to integrate richer intelligence models into their work.	Easy to use programming interface	Yes
Caffe	The Caffe deep learning framework makes implementing state-of-the-art deep learning easy.	Process over 40M images per day with a single NVIDIA K40 or Titan GPU.	Single only
Caffe* Parallel	This is a faster framework for deep learning, it's forked from BVLC/caffe (master branch). This allows data-parallel via MPI.	Using the GPU cluster processing mass image data	Yes
Chainer	DL framework that makes the construction of neural networks (NN) flexible and intuitive.	Dynamic NN construction, which makes debugging easier. CPU/GPU-agnostic coding, which is promoted by CuPy, partially NumPy-compatible multidimensional array library for CUDA. Data-dependent NN construction, which fully exploits the control flows of Python without magic.	Yes
Clarifai	Clarifai brings a new level of understanding to visual content through deep learning technologies. Clarifai uses GPUs to train large neural networks to solve practical problems in advertising, media, and search across a wide variety of industries.	GPU-based training and inference. Recognizes and indexes images with predefined classifiers, or with custom classifiers.	Yes
CNTK	Microsoft's Computational Network Toolkit (CNTK) is a unified computational network framework that describes deep neural networks as a series of computational steps via a directed graph.	Supports many applications, including Speech Recognition, Machine Translation, Image Recognition, Image Captioning, Text Processing and Relevance, Language Understanding, Language Modeling	Yes
* **Cylance**	Advanced machine leaning end point malware detection solution	End Point malware detection build using GPU deep learning technology.	Yes

* Indicates new application

*	**DeepBench**	The primary purpose of DeepBench is to benchmark operations that are important to deep learning on different hardware platforms.	DeepBench consists of a set of basic operations (dense matrix multiplies, convolutions and communication) as well as some recurrent layer types. Both forward and backward operations are tested. This first version of the benchmark will focus on training performance in 32-bit floating-point arithmetic.	Yes
	Deeplearning4j	Deeplearning4j is the most popular deep learning framework for the JVM, and includes all major neural nets such as convolutional, recurrent (LSTMs) and feedforward.	Integrates with Hadoop and Spark to run distributed. Java and Scala APIs. Composable framework that facilitates building your own nets. Includes ND4J, the Numpy for Java.	Yes
*	**DeepInstinct**	Zero day end point malware detection	Zero-day threats & APT attack detection on endpoints, servers and mobile devices.	Yes
	Dextro	Dextro's API uses deep learning systems to analyze and categorize videos in real-time.	Object and scene detection, Machine transcription for audio Motion and movement detection.	Yes
*	**H2O**	H2O is a popular machine learning platform which offers GPU-accelerated deep learning by integrating popular deep learning frameworks.	Supports TensorFlow, Caffe and MXNet	Yes
	IntelligentVoice	Far more than a transcription tool, this speech recognition software learns what is important in a telephone call, extracts information and stores a visual representation of phone calls to be combined with text/instant messaging and E-mail. Intelligent Voice's search and alert makes it possible to tackle issues before they arise, address data security concerns and monitor physical access to data.	Advanced Speech Recognition across large data sets, JumpTo Technology, for data visualisation, E-Discovery, extraction from phone calls, IM & Email defining key phrases and emotional analysis. Compliance, defining key conversations and interactions	Yes
*	**Keras**	Keras is a minimalist, highly modular neural networks library, written in Python, and capable of running on top of either TensorFlow or Theano. Keras was developed with a focus on enabling fast experimentation.	cuDNN version depends on the version of TensorFlow and Theano installed with Keras. Supported Interfaces: Python	Yes
	Labellio	The world's easiest deep learning web service for computer vision, which allows everyone to build own image classifier with only web browser.	Neural net fine-tuning for image data, data crawling, data browsing as well as drag-and-drop style data cleansing backed by AI support.	Yes
	MatConvNet	CNNs for MathWorks MATLAB, allows you to use MATLAB GPU support natively rather than writing your own CUDA code	Building Blocks, Simple CNN wrapper, DagNN wrapper, cuDNN implemented	Yes
*	**Meson**	Netflix's general purpose workflow orchestration and scheduling framework built to manage ML pipelines that execute workloads across heterogeneous systems.	It manages the lifecycle of several ML pipelines that build, train and validate personalization algorithms that drive video recommendations.	Yes
	MetaMind	Provides a deep learning API for image recognition and text sentiment analysis. Uses either prebuilt, public, or custom classifiers.	GPU-based training and inference. Recognizes image and analyzes text, creates and trains classifiers with tooling for uploading and managing datasets.	Yes
*	**MXNET**	MXnet is a deep learning framework designed for both efficiency and flexibility that allows you to mix the flavors of symbolic programming and imperative programming to maximize efficiency and productivity.	MXnet supports cuDNN v5 for GPU acceleration.	Yes

* Indicates new application

	Neon	Neon is a fast, scalable, easy-to-use Python based deep learning framework that has been optimized down to the assembler level. Neon features a rich set of example and pre-trained models for image, video, text, deep reinforcement learning and speech applications.	Supported Interfaces: Python, R, C++, Julia	Yes
*	**PaddlePaddle**	PaddlePaddle (PArallel Distributed Deep LEarning) is an easy-to-use, efficient, flexible and scalable deep learning platform, which is originally developed by Baidu scientists and engineers for the purpose of applying deep learning to many products at Baidu.	Optimized math operations through SSE/ AVX intrinsics, BLAS libraries (e.g. MKL, ATLAS, cuBLAS) or customized CPU/GPU kernels. Highly optimized recurrent networks which can handle variable-length sequence without padding. Optimized local and distributed training for models with high dimensional sparse data.	Yes
	Tensorflow	Google's TensorFlow is an open source software library for numerical computation using data flow graphs. Nodes in the graph represent mathematical operations, while the graph edges represent the multidimensional data arrays (tensors) communicated between them.	TensorFlow is flexible, portable and performant creating an open standard for exchanging research ideas and putting machine learning in products.	Yes
	Theano	Theano is a symbolic expression compiler that powers large-scale computationally intensive scientific investigations.	Abstract expression graphs for transparent GPU acceleration.	Yes
	Torch7	Torch7 is an interactive development environment for machine learning and computer vision.	Computational back-ends for multicore GPUs.	Single only
	Trakomatic OSense, Otrack	Video Analytics Solution for retail, supermarkets, shopping mall and banking.	People detection & tracking, Crowd density estimation, Gender classification and age estimation, Person re-identification.	Yes
*	**UETorch**	It provides an embedded Torch environment within the powerful Unreal Engine 4. This allows one to have deep learning models directly interact with the game world, and paves way for powerful research. An example of doing AI Research using UETorch is for a neural network to learn physics and intuition about the real world.	Game interaction and physics, CUDA-optimized deep learning and neural networks. CuDNN supported.	Yes

Public Sector

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Comprimato JPEG2000 Codec	A high performing, GPU powered, JPEG2000 encoder and decoder SDK which can be integrated into almost any application.	Very large image processing, specific area decoding, multi resolution/quality decoding supporting all GEOSPATIAL image formats. (eg NITF, BIIF). Mobile and embedded platform friendly.	Yes
DigitalGlobe - Advanced Ortho Series	Geospatial visualization	Image orthorectification	Yes
Elcomsoft	High-performance distributed password recovery software with NVIDIA GPU acceleration and scalability to over 10,000 workstations.	GPU acceleration for password recovery, 10-100x speedup for password recovery.	Yes
Esri ArcGIS for Desktop (ArcMap and ArcGIS Pro) – Spatial Analyst and 3D Analyst	Determines the raster surface locations visible to a set of observer features, using geodesic methods.	Viewshed2 transforms the elevation surface into a geocentric 3D coordinate system and runs 3D sightlines to each transformed cell center.	Yes
Eternix - Blaze Terra	Geospatial visualization	3D visualization of geospatial data	Yes
GeoWeb3d Desktop	Geospatial visualization	3D visualization of geospatial data	Yes
Harris ENVI	Image Processing and Analytics	Image orthorectification, Image transformation, atmospheric correction, Panchromatic co-occurrence texture filter	Yes

* Indicates new application

Herta Security - BioSurveillance NEXT, BioFinder	Real time facial recognition and forensic alerts against multiple watchlists.	Supports crowded scenes, difficult lighting, faster than real-time analysis, partial face concealment.	Yes
Intergraph Motion Video Analyst	Video filters and mosaic'ing - Geo-fuses FMV analytics with intelligence data.	Full motion video ortho mosaic processing, de-hazing algorithms.	Single only
Intuvision Panoptes 3.0	Video analytics	Object recognition and change detection	Yes
LuciadLightspeed	Geospatial visualization and analysis	Geospatial situational awareness	Single only
Manifold Systems	Full-featured GIS, vector/raster processing & analysis	Manifold surface tools	Yes
MotionDSP - Ikena ISR	Real-time full motion video (FMV) and wide-area motion imagery (WAMI) enhancement and computer-vision-based analytics software for intelligence analysts	Real-time super-resolution-based video enhancement on live streams, geospatial visualization, target detection and tracking, and fast 2-D mapping	Yes
NerVve Visual Search Solution (NVSS)	Video/Image Live and Forensic Search	Video and image content search	Yes
OpCoast SNEAK	Electromagnetic signals propagation modeling for complex urban and terrain environments.	Ray tracing, DTED and remote sensing inputs.	Yes
PCI Geomatics GXL	Image processing	Image orthorectification and additional image processing	Yes
Skyline Software - Terrabuilder PhotoMesh	PhotoMesh integrates a GPU-based, fast algorithm, able to automatically build 3D models from simple photographs. PhotoMesh revolutionizes the use of geospatial data by fully automating the generation of high-resolution, textured, 3D mesh models from standard 2D images.	3D model building from imagery; building texture generation.	Yes
SocetGXP - BAE Systems	The Automatic Spatial Modeler (ASM) is designed to generate 3-D point clouds with accuracy similar to LiDAR, which can extract 3-D objects from stereo images. ASM can extract dense 3-D point clouds from stereo images, and extract accurate building edges and corners from stereo images with high resolution, large overlaps, and high dynamic range.	Automated 3D feature extraction	Yes
SynerScope	Big data visualization and data discovery, for combining Analytics on Analytics with IoT compute-at-the-edge smart sensors.	Real-time Interaction with data	Single only

Manufacturing/AEC: CAD and CAE

COMPUTATIONAL FLUID DYNAMICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Altair AcuSolve	General purpose CFD software	Linear equation solver	Yes
ANSYS - Fluent	General purpose CFD software	Radiation heat transfer model, linear equation solver	Yes
ANSYS - Polyflow	CFD software for the analysis of polymer and glass processing	Direct Solvers	Yes
Autodesk - Moldflow	Plastic mold injection software	Linear equation solver	Single only
CPFD Barracuda-VR and Barracuda	Fluidized bed modeling software	Linear equation solver, particle calculations	Single only
DHI - MIKE 21	2D hydrological modelling of coast and sea	Hydrodynamics; Advection-dispersion; sand and mud transport; coupled modelling; particle tracking; oil spill; ecological modelling; agent based modelling; various wave models.	Yes
DHI - MIKE FLOOD	1D & 2D urban, coastal, and riverine flood modelling	Hydrodynamics	Yes

* Indicates new application

	FluiDyna - Culises for OpenFOAM	Solver library for general purpose CFD software	Linear equation solvers	Yes
	FluiDyna nanoFluidX	Meshless CFD solver (Smoothed Particle Hydrodynamics, SPH)	Single/multi-phase flows, thermal, moving/ rotating geometries, inlet/outlet boundary conditions	Yes
	FluiDyna ultraFluidX	Lattice-Boltzmann-based CFD solver for ground transportation aerodynamics	Single-phase flows, isothermal, integrated volume mesh generation, local refinement, LES turbulence modeling	Yes
*	**HiFUN - by Sandl**	High Resolution Flow Solver on Unstructured Meshes. State-of-the art Euler/RANS solver. Super scalability on massively parallel HPC platforms. The code is ported using OpenACC directives for Nvidia GPU.	HiFUN imbibes most recent CFD technologies; many of them home grown. HiFUN exhibits highly scalable parallel performance with its ability to scale upto several thousand processors on massively parallel computing platforms. Capable of handling complex geometries and flow physics arising in high lift flows.	Yes
	midas NFX(CFD)	General purpose CFD software based on FEM	Linear equation solver (Iterative Solver and AMG Preconditioner)	Single only
	Numeca	Fine/ Turbo software product—a structured, multi-block, multi-grid CFD solver targeting the turbo machinery industry	Multi-grid solver	Yes
	Prometech - Particleworks	Particle-based CFD software	Implicit and explicit solvers	Yes
*	**Realflow - DYVERSO**	3D modeling, animation, and rendering	Fluid solver (DY-SPH, DY-PBD)	Single only
	Turbostream Ltd.	CFD software for turbomachinery flows	Explicit solver	Yes
	Vratis Speed IT FLOW	Incompressible single-phase CFD software	Finite volume solver	Single only
	Vratis SpeedIT for OpenFOAM	Solver library for general purpose CFD software	Linear equation solvers	Yes
*	**Zeus Numerix**	Simulation of Flow around buildings	Discrete computational technique	Yes [underway]

Research CFD Developments

	APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
	DualSPHysics	SPH-based CFD software	SPH model	Yes
*	**ELBE**	Lattice Boltzmann Method (LBM) flow solver	LBM solver	Yes
	FEFLO (GMU - Lohner)	General purpose CFD software for compressible and incompressible flows	Implicit and explicit solver	Yes
	GIN3D (Boise St - Senocak)	General purpose CFD software for incompressible flows	Implicit solver	Yes
	HiFiLES (Stanford - Jameson)	General purpose CFD software for compressible flows.	Explicit solver	Yes
	HiPSTAR (University of Southampton - Sandberg)	CFD software for compressible reacting flows	Explicit solver	Yes
*	**INCOMP3D**	Fully implicit 3D incompressible flow solver	Linear solver	Yes
	JENRE, Propel (NRL)	CFD software for compressible flows	Explicit solver	Yes
	NASA FUN3D	General purpose CFD software	Linear equation solver	Single only
	PyFR (Imperial College - Vincent)	General purpose CFD software for compressible flows.	High-order FR solver	Yes
	S3D (Sandia and Oak Ridge NL)	Direct numerical solver (DNS) for turbulent combustion	Chemistry model	Yes

* Indicates new application

COMPUTATIONAL STRUCTURAL MECHANICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Altair OptiStruct	Industry proven, modern structural analysis solver and solution for structural design and optimization.	Direct solvers	Single Only
Altair RADIOSS Implicit	Simulation and analysis tool for structural mechanics	Iterative solvers	Yes
ANSYS - Mechanical	Simulation and analysis tool for structural mechanics	Direct and iterative solvers	Yes
Dassault Systèmes SIMULIA Abaqus/ Standard	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
Dassault Systèmes SIMULIA 3DEXPERIENCE	Realistic simulation solution (Uses Abaqus Standard for GPU computing).	Direct sparse solver	Single only
Impetus Afea	Predicts large deformations of structures and components exposed to extreme loading conditions.	Non-linear Explicit Finite-Element Solver	Yes
LS-DYNA Implicit	Simulation and analysis tool for structural mechanics	Linear equation solver	Yes
midas GTS NX	Simulation tool for geo-technical analysis	Linear equation solver(Multi Frontal Solver)	Single only
midas NFX(Structural)	Simulation and analysis tool for structural mechanics	Linear equation solver(Multi Frontal Solver)	Single only
MSC - Marc	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
MSC Nastran	Simulation and analysis tool for structural mechanics	Direct sparse solver	Yes
Rocky DEM	Discrete Element Modeling (DEM)-based particle simulation software.	Explicit DEM solver (dry/sticky contact rheologies), 1-way & 2-way coupling with ANSYS Fluent and ANSYS Mechanical.	Single only
Siemens NX Nastran	Simulation and analysis tool for structural mechanics.	Linear equation solver	Single only

DESIGN AND VISUALIZATION

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Allegorithmic Substance Designer	Material shader edition, market reference for procedural texture creation.	Iray rendering including textures/substances and bitmap texture export to render in any Iray powered compatible with MDL.	Yes + NVIDIA Quadro VCA
Allegorithmic Substance Painter	Intuitive interactive 3D painting software with physics and particle support.	Iray rendering to enhance all artwork released with the software	Yes
Autodesk - AutoCAD	2D and 3D CAD design, drafting, modeling, architectural drawing, and engineering software. Supports Open GL. Native DWG™ support.	Surface, mesh, and solid modeling tools, model documentation tools, parametric drawing capabilities. Native DWG™ support. GRID Support.	Single only
Autodesk - AutoCAD Design Suite	AutoCAD 2014 software, plus tools to create, capture, connect, and showcase designs.	2D/3D display of designs, interactive 3D presentation with realistic materials, rendering-ray tracing.	Single only
Autodesk - 3ds Max	3D animation creative toolset for modeling, animation, simulation, and rendering for product and building designs.	3D modeling, mesh and surface modeling, improved Nitrous viewport performance, iray rendering.	Yes
Autodesk - Inventor	3D mechanical design, documentation, and product simulation.	Uses BIM for intelligent building components to improve design accuracy.	Single only
* **Autodesk - Remake**	ReMake is a solution for converting reality captured with photos or scans into high-definition 3D meshes. These meshes that can be cleaned up, fixed, edited, scaled, measured, re-topologized, decimated, aligned, compared and optimized for downstream workflows entirely in ReMake.	Generation of 3D meshed models from laser scans or photos of an object. GPU accelerated photogrammetry process from 2D to 3D. 3D model display accelerated by GPU's for smooth navigation of converted models in all display modes.	Yes

* Indicates new application

	Autodesk - Revit	Building Information Modeling (BIM) for architecture, engineering, and construction.	Modeling (BIM) to design, build, and maintain higher-quality, more energy-efficient buildings. GRID support.	Single only
*	**Autodesk- Stingray**	The Stingray engine includes 3D game creation tools, design visualization, real-time 3D rendering, and virtual reality support. Stingray has great workflows with 3ds Max, Maya, and Maya LT.	Fully featured viewing technology accelerated by GPU's for core graphics display as well as complete VR workflows.	Yes
	Autodesk- VRED	VRED™ 3D visualization software helps automotive designers and engineers create product presentations, design reviews, and virtual prototypes. Use Digital Prototyping to quickly visualize ideas and evaluate designs.	Enhanced geometry behavior, Automotive product interoperability, Navigation in a scene, Import Alias layer structure, Asset Manager improvements, Integrated file converter, Analytic rendering modes, Gap Analysis tool, Oculus Rift support, Animation module, Multiple rendering modes, Subsurface scattering, Displacement mapping	Yes
	Cast Software - WYSIWYG	The WYSIWYG software products, designed specifically for lighting professionals, offers a range of solutions to meet the needs of designers, assistants, electricians, console operators, teachers, and students.	The speed of wysiwyg's Shaded Views depends entirely on GPU, the GPU will have an easier time rendering ten risers consolidated into one Mesh, than rendering them as individual risers, Wysiwys also support NVIDIA SLI technologies.	Yes
*	**Chaos Group - V-Ray RT**	GPU renderer	CUDA interactive GPU rendering	Yes
	Dassault Systèmes - CATIA	3DEXPERIENCE R2017x highly accelerated and improved real-time engine with native VR support and optimized GPU scaling.	Load and render smoothly your large assembly models with Substance support for gamelike experience with native professional CAD data. Experience your CAD model design in VR with no data transformation.	Single only
	Dassault Systèmes - CATIA Live Rendering	Realistic 3D Rendering on full CATIA 3D CAD model	Physically Based Rendering with no data preparation thanks to native NVIDIA Iray Photoreal integration and interactive realistic rendering using NVIDIA Iray IRT.	Yes + NVIDIA Quadro VCA
	Dassault Systèmes - 3DEXCITE DeltaGen	Redefines high-end 3D visualization and realtime interaction. This latest version gives users a broad suite of robust new features to truly revolutionize processes and help increase visual quality, speed, and flexibility.	Interactive ray tracing and global illumination. Integration with Siemens TeamCenter. Cluster support Realtime & Offline Production Process Integration and scene building. Scene Analysis, Xplore DeltaGen, SDK for DeltaGen.	Yes
	Dassault Systèmes - SOLIDWORKS	Covers all aspects of product development process with a seamless, integrated workflow—design, verification, sustainable design, communication and data management.	High performance in Shaded, Shaded w/ Edges, and RealView modes, FSAA for sharp edges, Order Independent Transparency Real time photorealistic renderings with SOLIDWORKS Visualize, an Iray-based application.	Single only
	Dassault Systèmes – SOLIDWORKS Visualize	Easy to use photorealistic rendering software	Iray-based ray-tracing, animation support, network rendering.	Yes + NVIDIA Quadro VCA
*	**ESI Group – IC.IDO**	3D immersive virtual prototyping solution with real-time physics simulation	High performance optimized OpenGL pipeline built on NV Pro Pipeline	Yes
	NVIDIA Iray	A ready-to-integrate, physically-based, photorealistic rendering solution.	Iray Interactive; Iray Photoreal; Iray Cluster. Fast interactive ray tracing; Physically-based, global-illumination rendering; Distributed cluster rendering.	Yes
*	**Optis VRXPERIENCE**	Professional VR experience for training and validation	Run your professional CAD data with haptics feedback powered by PhysX and accurate light simulation powered by Optis SPEOS (SPEOS powered by CUDA soon)	No
	Otoy - Octane Render	GPU renderer	GPU rendering	Yes

* Indicates new application

PTC - Creo Parametric	Parametric design solution suite.	Anti-aliasing, better lighting and enhanced shaded-with-edges mode. Immersive design environment with realistic materials. GRID Support. Support for enhanced line display generated with GPU support.	Single only
Siemens PLM Software NX and Teamcenter	Product lifecycle management solutions from design to simulation to production to service.	Design software, NX, and PLM viewer applications, TcVis and Active Workspace. GRID support.	Single only
Top Systems T-FLEX CAD	3D and 2D parametric design, simulation, photorealistic rendering.	High performance visualization, real time photorealistic rendering	Yes

ELECTRONIC DESIGN AUTOMATION

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Altair FEKO	3D EM modeling and simulation	FDTD solver, MoM solver, CMA Solver	Yes; Single for FDTD solver
ANSYS - HFSS	Simulation tool for modeling 3-D full-wave electromagnetic fields in high-frequency and high-speed electronic components.	Transient solver	Yes
ANSYS - Nexxim	Circuit simulation engine for RF/analog/ mixed-signal IC design; IBIS-AMI analysis speedup with GPU computing.	AMI analysis	Single only
ANSYS - Savant	Simulation tool for installed antenna performance and antenna-to-antenna coupling.	High-frequency solver	Yes
CST STUDIO SUITE® and CST MICROWAVE STUDIO®	Accurate and efficient computational solution for 3D simulation of electromagnetic devices in a wide range of frequencies.	Transient Solver Integral Equation Solver Asymptotic Solver Multilayer Solver	Yes
* **CST STUDIO SUITE® and CST MPHYSICS® STUDIO**	Multiphysics simulation including thermal, CFD and mechanical capabilities. Tightly integrated with CST's electromagnetic solvers.	Conjugated Heat Transfer Solver	Yes
* **D2S CDP**	GPU-Acceleration of real-time in-line enhancement of semiconductor manufacturing equipment	Simulation-based processing	Yes
D2S TrueMask® MDP	GPU-accelerated simulation and data preparation for mask writing	Simulation-based processing	Yes
* **D2S TrueModel®**	GPU-accelerated simulation and geometric checking of curvilinear shapes	Simulation-based processing	Yes
JMAG	FEA software for electromechanical design. Fast solver / High quality mesh / Advanced modeling technologies.	EM transient solver EM time harmonic solver EM static solver	Yes
KeySight - ADS	Simulation tool for design of RF, microwave and high speed digital circuits.	Transient Convolution simulation with BSIM4 models	Single only
KeySight - EMPro	Modeling and simulation environment for analyzing 3D EM effects of high speed and RF/Microwave components.	FDTD solver	Yes
* **Lucernhammer-Serenity**	EM simulation (RCS solver) tool	MOM	Yes
Remcom - XFdtd	3D EM modeling and simulation	FDTD solver	Yes
* **Remcom - Xstream**	3D EM simulation	FDTD solver	Yes
* **Remcom - Wireless InSite**	Uses OptiX 3.8 for Ray-tracking and Propagation prediction	X3D ray tracer	Yes
SPEAG - SEMCAD-X	3D EM modeling and simulation	FDTD solver	Yes
* **VSim for Electromagnetics**	Physics simulation and modeling software for EM	FDTD	Single only
* **WIPL-D 2D**	EM Simulation tool	Frequency domain method for moments	Yes (Max- 3 GPUs)
* **ZMT Zurich MedTech AG - Sim4Life**	3D EM & Acoustic modeling and simulation	FDTD & Acoustic solvers	Yes

* Indicates new application

Media and Entertainment

ANIMATION, MODELING AND RENDERING

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
3DAliens- Glu3d	SPH fluid simulation	Faster simulation	Single only
AAA Studio - FurryBall	GPU renderer	CUDA and DirectX GPU rendering	Single only
Autodesk - 3ds Max + NVIDIA iray	3D modeling, animation, and rendering	Iray interactive, photorealistic and physically correct rendering	Yes
Autodesk - Maya	3D modeling, animation, and rendering	Increased model complexity, larger scenes	Yes
Autodesk - Motion Builder	Character animation and motion capture	Increased model complexity at interactive rates	Single only
Autodesk - Mudbox	3D sculpting	Increased model complexity at interactive rates	Single only
Blastcode - Kilton/ Megaton	Physics-based simulation plug in	Faster simulation	Single only
Cebas - moskitoRender	GPU renderer	CUDA-based GPU rendering	Yes
Chaos Group - V-Ray RT	GPU renderer	CUDA interactive GPU rendering	Yes
Jawset - TurbulenceFD	Physics-based simulation plug-in	GPU simulation using CUDA	Single only
Maxon - Cinema 4D	3D modeling, animation, and rendering	Increased model complexity at interactive rates	Single only
NewTek - Lightwave	3D modeling, animation, and rendering	Increased model complexity at interactive rates	Single only
* **Next Limit – Maxwell**	GPU renderer	CUDA-accelerated rendering	Yes
Otoy - Octane Render	GPU renderer	GPU rendering	Yes
Pixologic - Sculptris	3D sculpting	Increased model complexity at interactive rates	Single only
Redshift - Renderer	GPU-accelerated, biased renderer	CUDA-based GPU final-frame rendering	Yes
Side Effects - Houdini	3D simulation and rendering	GPU simulation using OpenCL	Single only
The Foundry - Mari	3D paint	Increased model complexity at interactive rates	Single only
The Foundry - Modo	3D modeling, animation and rendering	Increased model complexity, larger scenes	Single only

COLOR CORRECTION AND GRAIN MANAGEMENT

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Adobe - SpeedGrade CC	Color grading	Real-time grading and finishing with Lumetri Deep Color Engine.	Single only
ARRI - RAW Converter	RAW de-Bayering and primary color grading	CUDA-accelerated de-bayering and grading	Single only
Assimilate - Scratch	Color grading and finishing	Accelerated debayering for real-time digital finishing	Single only
Blackmagic Design - DaVinci Resolve	Color grading and editing	Real-time color correction and de-noising	Yes
Canon - Cinema RAW SDK	RAW de-bayering	GPU-accelerated de-bayering	Single only
Cinnafilm - Dark Energy	Application and plug-in for image enhancement	Image de-noising and restoration	Yes
Digital Vision - Nucoda	Color grading	De-bayering for color correction	Single only
Fastvideo - Fast CinemaDNG	CUDA software for extremely fast RAW video & photo processing with benchmark option	High quality GPU-based RAW video processing, up to 160 fps speed, more than 4K resolution, sophisticated (wavelet) realtime denoising (pre and post bayer), all standard color corection features and monitoring options, export to 16-bit TIF or 10-bit ProRes	Yes
Fastvideo - GPU Debayer	High performance GPU debayer	High performance debayer on CUDA	Yes

* Indicates new application

*	**FilmLight - Baselight**	Color grading	Real-time color correction	Yes
	Marquise Technologies - Rain	Color grading	CUDA-based real-time color correction	Single only
	Red Digital Cinema - REDCINE-X PRO	Primary color grading	CUDA-accelerated de-bayering and grading	Single only
	Red Giant - Magic Bullet Looks	Color and finishing tools	Faster effects	Single only
	Snell Advanced Media - Pablo Rio	Color grading and finishing	Real time color correction	Yes
	SGO - Mistika	Color grading and finishing	Real-time color correction and finishing	Single only
	The Foundry - COLORWAY	Color grading	Accelerated color grading	Single only
	The Pixel Farm PFClean	Image restoration and remastering	CUDA-based image processing acceleration	Single only
	Wavelet Beam - Grain and Noise Reducer	Video noise reduction	CUDA-accelerated grain and noise reduction	Yes

COMPOSITING, FINISHING AND EFFECTS

	APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
	Adobe - After Effects CC	Motion graphics and effects	3D ray tracing engine based on NVIDIA OptiX	Yes
	Autodesk - Flame Premium	Finishing and color grading	Integrated toolset for 3D VFX, editorial, and color grading	Yes
	Blackmagic Design - Fusion	Effects and compositing	Faster effects	Single only
	Boris FX - Continuum Complete	Visual effects plug-in	Faster effects	Single only
	Boris FX - Monsters GT	Visual effects plug-in	Faster effects	Single only
	Boris FX - Sapphire	Visual effects plug-in	Faster effects	Single only
	CoreMelt - Complete	Visual effects plug-in	Faster effects	Single only
	Neat Video - Open FX	Video noise reduction plug-in	Faster effects	Single only
	NewBlueFX - Video Essentials	Video effects plug-in	Faster effects	Single only
	Pixelan - FilmTouch	Video effects plug-in	Faster effects	Single only
	Re:Vision Effects - Twixtor	Visual effects plug-in	Faster effects	Single only
	Red Giant - Effects Suite	Visual effects plug-in	Faster effects	Single only
	ROBUSKEY	Chroma keyer plug-in	Faster effects	Single only
	SGO - Mamba FX	High-end compositing	Faster keying, tracking, painting and restoration	Single only
	The Foundry - HIERO	Shot management, conform and review timeline	Better interactivity	Single only
	The Foundry - NUKE, NUKEX and NUKE Studio	Compositing tools with 3D tracker	Faster effects	Single only
	Video Copilot - Element 3D	3D object based particle system	Faster effects	Yes
	Video Copilot - Twitch	Video effects plug-in for After Effects	Faster effects	Single only

EDITING

	APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
*	**Adobe – Illustrator CC**	Digital design	Accelerated canvas for faster pan and zoom. Optimized for NVIDIA based on NV Path Rendering	Single only
*	**Adobe – Lightroom CC**	Photo editing	Faster photo edits throughout entire Develop module	Single only

* Indicates new application

* **Adobe Media Encoder**	Video editing	Faster output rendering based on Mercury Playback Engine	Yes
Adobe - Photoshop CC	Image editing	Over 30 effects for smoother image manipulation in Mercury Graphics Engine	Single only
Adobe - Premiere Pro CC	Video editing	Real-time video editing & accelerated output rendering based on Mercury Playback Engine	Yes
Apple - Final Cut Pro	Video editing	Faster effects	Single only
Autodesk - Smoke	Finishing and editing	Faster effects	Single only
Avid - Media Composer	Video editing	Faster video effects, unique stereo 3D capabilities	Single only
EditShare - Lightworks	Video editing	Faster effects	Single only
Grass Valley - Edius Pro	Video editing	Faster effects	Single only
Imagine Communications - Velocity	Video editing	Faster effects	Single only
Magix - Vegas Pro	Video editing	Faster video effects and encoding	Single only
Snell Advanced Media - Qube	Broadcast video editing	Faster video effects, unique stereo 3D capabilities	Single only
Sony - Catalyst Browse, Prepare and Edit	Video editing	Faster effects, transitions and encoding	Single only

ENCODING AND DIGITAL DISTRIBUTION

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
ArcVideo - Core	Video processing and transcoding	Accelerated transcoding and encoding	Yes
ArcVideo - Live	High-density, real-time video processing and encoding.	Accelerated broadcast encoding with NVIDIA CUDA and NVENC.	Yes
Cinnafilm - Tachyon	Standards conversion	Video processing and frame rate conversion	Yes
Comprimato - JPEG2000 Codec	JPEG2000 encoding and decoding for DCP, IMF, video editing, broadcast contribution, and archiving.	Faster than real-time UltraHD / 4K, lossy and mathematically lossless, high bit-depth (HDR), performance scalable, GPU accelerated.	Yes
Dalet - Amberfin	Transcoding and video quality analysis	GPU-accelerated video procession and encoding	Single only
Elemental - Elemental Live	Live streaming video processing and encoding	Video encoding and video processing	Yes
Elemental - Elemental Server	File-based video processing and encoding	Video encoding and video processing	Yes
ERLAB - Multiplatform Transcoder	Video processing and encoding software	Pre-processing encoding, decoding, post-processing and delivery	Single only
Fastvideo - GPU Image Processing SDK	Full image processing pipeline on CUDA	Full image processing pipeline on GPU for real-time imaging applications: Flat Field correction, Demosaicing, Denoising, Color correction, LUT, Resize, Sharp, OpenGL output, JPEG, JPEG2000, Raw Bayer, H.264 encoding	Yes
Fastvideo - H.264 encoder	H.264 encoding on GPU	NVENC accelerated video encoding	Yes
Fastvideo - SDK	JPEG, JPEG2000, Raw Bayer codecs	Fast JPEG, JPEG2000, Raw Bayer encoding and decoding on CUDA	Yes
Interra - Baton	Video quality analysis	GPU accelerated video quality assessment	Single only
isovideo - Viarte	Video standards conversion	CUDA-accelerated video procession and encoding	Yes
METUS - Ingest	Video recording, transcoding, and streaming software.	CUDA Accelerated video recording, encoding and broadcast transcoding	Single only
Root6 - Content Agent	Automated transcoding and workflow management	GPU-accelerated video procession and encoding	Yes

* Indicates new application

Sorenson Media - Squeeze	Video transcoding application and plug-In	Video encoding and video processing	Yes
Snell Advanced Media - Alchemist on Demand	Video standards conversion	GPU-accelerated video procession and encoding	Yes
Tektronix - Aurora	Automated video quality measurement	GPU-accelerated video quality assessment	Single only
Telestream - Vantage Lightspeed	Video transcoding and processing	Video encoding and video processing	Yes
Wowza - Streaming Engine Transcoder	H.264 video encoding	NVENC accelerated video encoding	Single only

ON-AIR GRAPHICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Brainstorm - eStudio	Virtual sets and motion graphics	Real-time rendering	Single only
ChyronHego - GS2 Graphics Engine	On-air graphics	Real-time rendering	Single only
ChyronHego - Mosaic	On-air graphics	Real-time rendering	Single only
Cinegy - Type	On-air Graphics	Real-time rendering	Single only
Dalet - Cube	On-air Graphics	Real-time rendering	Single only
Grass Valley - Vertigo	On-air Graphics	Real-time rendering	Single only
Imagine Communications - Nexio Channelbrand	On-air graphics	Real-time rendering	Yes
Imagine Communications - Nexio G8	On-air graphics	Real-time rendering	Single only
Imagine Communications - Nexio TitleOne	On-air graphics	Real-time rendering	Single only
Monarch - Brodcaast Dscript 3D	3D on-air graphics	Real-time rendering	Single only
Monarch - Virtuoso	Virtual sets and motion graphics	Real-time rendering	Single only
Pixel Power - Clarity	On-air graphics	Real-time rendering	Single only
RT Software - tOG	On-air graphics	Real-time rendering	Single only
Vizrt - Viz Engine	On-air graphics and virtual sets	Real-time rendering	Single only
Wasp3D - CG	On-air graphics and virtual sets	Real-time rendering	Single only

ON-SET, REVIEW AND STEREO TOOLS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Autodesk - RV	Review and approval of 4K content	Real-time	Single only
3ality Technica - Intellicam	3D stereo camera adjustment	CUDA-based 3D imaging	Single only
Binocle3D - Disparity Killer	3D stereoscopic workflow	CUDA-based 3D imaging	Single only
Blackmagic Design - Dimension	3D stereoscopic workflow	Real-time	Single only
BlueFish - Fluid 4K Review	Review and approval of 4K content	Real-time video review	Single only
Colorfront - On-Set Dailies	Review, color grading and transcoding on set	Real-time	Yes
Lightcraft - Previzion	On-set virtual production	Real-time, virtual set production	Single only
MTI Film - Cortex Dailies	Review, color grading and transcoding on set	CUDA accelerated grading and transcoding	Single only
The Pixel Farm - PFTrack	3D scene creation and tracking	CUDA-accelerated tracking	Yes

* Indicates new application

WEATHER GRAPHICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Accuweather - Cinemative HD	Weather graphics	Real-time	Single only
Accuweather - Storyteller	Weather graphics	Real-time	Single only
ChyronHego - Metacast	Weather graphics	Real-time	Single only
MeteoGraphics - MeteoEarth	Weather graphics	Real-time	Single only
WSI - Max Weather	Weather graphics	Real-time	Single only

Medical Imaging

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
PowerGrid	Advanced MRI reconstruction modeling	Discrete Fourier Tranform	Yes

Oil and Gas

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Acceleware AxRTM AxKTM	Seismic processing	RTM, Kirchhoff, control source, electromagnetism, forward modeling.	Yes
BRS Labs AISight for SCADA	Proactive integrity management and real-time precursor alerts for enhanced SCADA operations in oil and gas.	24/7 real-time analysis and alerting scaling to thousands of sensors across remote and geographically dispersed locations including historical analysis and trend reports.	Yes
CGG- GeoVation	Seismic processing	Multiple algorithms (RTM, etc)	Yes
CGG- InsightEarth	Seismic interpretation	Horizon orientation attributes; automated fault extraction, 3D Curvature Attributes.	Yes
Echelon Stoneridge Technology	Reservoir simulator	Fully GPU-accelerated reservoir model, including dual-perm, dual porosity, pressure varying perm and porosity. Eclipse compatible input deck.	Yes
Esri ArcGIS for Desktop (ArcMap and ArcGIS Pro) – Spatial Analyst and 3D Analyst	Determines the raster surface locations visible to a set of observer features, using geodesic methods.	Viewshed2 transforms the elevation surface into a geocentric 3D coordinate system and runs 3D sightlines to each transformed cell center.	Yes
ffA Geoteric	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
ffA SEA3D Pro	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
ffA SVI Pro	Seismic interpretation	Attributes calculations, geobodies extraction	Yes
GeoMage Multifocusing	Seismic processing	Advanced seismic imaging technologies and services, as well as interpretation, geological modeling, and reservoir characterization.	Yes
* **Giant Gray – Graydient S (SCADA)**	Machine learning anomaly detection for large scale industrial data.	Proactive integrity management and real-time precursor alerts for enhanced SCADA operations in oil and gas. 24/7 real-time analysis and alerting scaling to thousands of sensors across remote and geographically dispersed location.	Yes
HUE Headwave Suite	Seismic interpretation	Attributes calculations, Volume Rendering	Yes
HUE HUEspace	Seismic interpretation	Interpretation development platform	Yes
OpenGeo Solutions OpenSeis	Seismic processing	Spectral Decomposition	Yes
Panorama Tech	Seismic processing, Modeling	Multiple algorithms (RTM, etc)	Yes

* Indicates new application

Paradigm Echos RTM	Seismic processing	RTM algorithm	Yes
Paradigm Geophysical VoxelGeo	Seismic interpretation	Volume Rendering, Horizon Flattening	Yes
Paradigm SKUA	Reservoir modeling	Faults, Horizons and Flow Simulation Grid	Yes
PumaFlow IFP	Reservoir simulation	GPU-accelerated linear solver	Yes
Ridgeway Kite Simulator	Reservoir simulation	Fully GPU-accelerated reservoir model, including surface facilities and multiple realization history matching.	Yes
Roxar RMS	Reservoir modeling	Multi GPU capabilities via HUEspace	Yes
Schlumberger Omega2 RTM	Seismic processing	Multiple algorithms (RTM, etc)	Yes
Seismic City Prestack Interpretation	Seismic processing	Multiple algorithms (RTM, etc)	Yes
SpectraSeis	Seismic processing	Full elastic wave-equation imaging and analysis of microseismic fracture data.	Yes
Stoneridge Technologies GAMPACK	Reservoir simulation	GPU Algebraic MultiGrid Package	Yes
Tsunami A2011	Seismic processing/Imaging package	RTM processing	Yes
Tsunami RTM	Seismic processing	RTM algorithm	Yes

Research: Higher Education and Supercomputing

COMPUTATIONAL CHEMISTRY AND BIOLOGY

Bioinformatics

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Arioc	High-throughput read alignment with GPU-accelerated exploration of the seed-and-extend search space.	Single-end alignment, paired-end alignment • Output in SAM or database-ready binary formats • Multiple GPU implementation	Yes
BarraCUDA	Sequence mapping software	Alignment of short sequencing reads, alignment of indels with gap openings and extensions.	Yes
BEAGLE-lib	BEAGLE is a high-performance library that can perform the core calculations at the heart of most Bayesian and Maximum Likelihood phylogenetics packages. It can make use of highly-parallel processors such as those in graphics cards (GPUs) found in many PCs.	Evaluation of likelihood for sequence evolution on trees and Arbitrary models (e.g. nucleotide, amino acid, codon) Speed-ups (over CPU only version): nucleotide model = up to 25x, codon model = up to 50x.	Yes
* **BioEM**	GPU-accelerated computing of Bayesian inference of electron microscopy images	BioEM can use CUDA for the cross-correlation step, which essentially consists of an image multiplication in Fourier space and a Fourier back-transformation.	Yes
Campaign	An open-source library of GPU-accelerated data clustering algorithms and tools.	K-means (and Kps-means, a K-means variant for GPUs with parallel sorting for improved performance), K-medoids, K-centers (a K-medoids variant in which medoids are placed only once according to a heuristic), Hierarchical clustering and Self-organizing map.	Single only
* **cryoSPARC**	Enables rapid, unbiased structure discovery of proteins and molecular complexes from cryo-EM data.	• Ab-initio reconstruction, heterogeneous reconstruction, and high-speed high-resolution refinement of 3D protein structures implemented on GPUs • Lean memory usage: 768x768x768 box size on a 12GB GPU for refinement • Multiple simultaneous jobs on multiple GPUs	Yes

* Indicates new application

CUDASW++	Open source software for Smith-Waterman protein database searches on GPUs.	Parallel search of Smith-Waterman database.	Yes
CUSHAW	Parallelized short read aligner	Parallel, accurate long read aligner for large genomes	Yes
G-BLASTN	GPU-accelerated nucleotide alignment tool based on the widely used NCBI-BLAST.	Blastn and megablast modes of NCBI-BLAST	Single only
GPU-Blast	Local search with fast k-tuple heuristic	Protein alignment according to BLASTP	Single only
* **Huygens**	Realize amazing deconvolution results within seconds using high-end NVIDIA GPU cards and the powerful Huygens deconvolution algorithms. The unique brick-splitting possibility is also available in the GPU mode, enabling you to deconvolve very large files on the GPU, even with cards with limited video-RAM	• Deconvolution of volumetric images and time series from widefield, confocal, light sheet, super-resolution STED microscopes and more. • Chromatic aberration and cross-talk correction, image stabilization and stitching • Visualization, tracking, colocalization and object analysis • Multi-GPU and cluster support	Yes
mCUDA-MEME	Ultrafast scalable motif discovery algorithm based on MEME .	Scalable motif discovery algorithm based on MEME.	Yes
* **Microvolution**	Microvolution's method starts with the proven Richardson-Lucy algorithm that is used by most software programs. Other vendors take mathematical shortcuts to speed up iterations, resulting in imprecise images after deconvolution. Microvolution takes no shortcuts. Our software delivers accurate images, up to 200 times faster.	3D deconvolution for fluorescence microscopy, Written for use only on GPUs	Yes
MUMmer GPU	High-throughput local sequence alignment program	Aligns multiple query sequences against reference sequence in parallel.	TBD
NVBIO	NVBIO is an open source C++ library of reusable components designed to accelerate bioinformatics applications using CUDA.	Data structures, algorithms, and utility routines useful for building complex computational genomics applications on CPU-GPU systems.	Yes
NVBowtie	A largely complete implementation of the Bowtie2 aligner on top of NVBIO.	Good coverage of Bowtie2 features and comparable quality results.	Yes
PEANUT	Read mapper for DNA or RNA sequence reads to a known reference genome.	Achieves supreme sensitivity and speed compared to current state of the art read mappers like BWA MEM, Bowtie2 and RazerS3. PEANUT reports both only the best hits or all hits.	Single only
REACTA	A modified version of GCTA with improved computational performance, support for Graphics Processing Units (GPUs), and additional features. The purpose of REACTA is to quantify the contribution of genetic variation to phenotypic variation for complex traits.	GRM creation, REML analysis, Regional Heritability (including multi-GPU).	Yes
* **RELION-2**	RELION (for REgularised LIkelihood OptimisatioN, pronounce rely-on) is a stand-alone computer program that employs an empirical Bayesian approach to refinement of (multiple) 3D reconstructions or 2D class averages in electron cryo-microscopy (cryo-EM).	Both image classification and high-resolution refinement have been accelerated up to 40-fold, and template-based particle selection has been accelerated almost 1000-fold on desktop hardware. Reduced memory requirements • High-resolution cryo-EM structure determination in a matter of day on a single workstation	Yes
SeqNFind	SeqNFind® is a powerful tool suite that addresses the need for complete and accurate alignments of many small sequences against entire genomes utilizing a unique hardware/ software cluster system for facilitating bioinformatics research in Next Generation sequencing and genomic comparisons.	Hardware and software for reference assembly, blast, SW, HMM, de novo assembly.	Yes

* Indicates new application

SOAP3	GPU-based software for aligning short reads with a reference sequence. It can find all alignments with k mismatches, where k is chosen from 0 to 3.	Short read alignment tool that is not heuristic based; reports all answers.	Yes
SOAP3-dp	SOAP3-dp: Ultra-fast GPU-based tool for short read alignment via index-assisted dynamic programming.	Borrows-Wheeler Transformation, Dynamic Programming.	Yes
UGene	Open source Smith-Waterman for SSE/ CUDA, Suffix array based repeats finder and dotplot.	Fast short read alignment.	Yes
WideLM	Fits numerous linear models to a fixed design and response.	Parallel linear regression on multiple similarly-shaped models.	Yes

Molecular Dynamics

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
* **ACEMD**	GPU simulation of molecular mechanics force fields, implicit and explicit solvent. 610 ns/day (DHFR)	• MD engine written for GPUs • Support AMBER & CHARMM force fields • Support unbiased simulations via HTMD • Support biased MD via PLUMED	Yes
AMBER	Suite of programs to simulate molecular dynamics on biomolecule.	PMEMD Explicit Solvent and GB Implicit Solvent	Yes
CHARMM	MD package to simulate molecular dynamics on biomolecule.	Implicit (5x), Explicit (2x) Solvent via OpenMM, now ported natively to GPUs.	Yes
DESMOND	High-speed molecular dynamics simulations of biological systems.	The code uses novel parallel algorithms and numerical techniques to achieve high performance and accuracy.	Yes
ESPResSo	Highly versatile software package for performing and analyzing scientific Molecular Dynamics many-particle simulations of coarse-grained atomistic or bead-spring models as they are used in soft-matter research in physics, chemistry and molecular biology.	Hydrodynamic / Electrokinetic forces P3M electrostatics.	Yes
Folding@Home	A distributed computing project that studies protein folding, misfolding, aggregation, and related diseases.	Powerful distributed computing molecular dynamics system; implicit solvent and folding.	Yes
* **Genesis**		• Powerful parallelization for hybrid (CPU+GPU) systems • Full electrostatics with PME • Large (1-100 million atoms) biological systems - See more at: http://www.nvidia.com/object/gpu-applications.html?mDicS#sthash.JXqtkvY5.dpuf	Yes
* **GPUgrid.net**	Distributed computing project with thousands of GPUs for molecular simulations.	• High-throughput all-atom biomolecular simulations • Protein folding and binding	Yes
GROMACS	Simulation of biochemical molecules with complicated bond interactions.	Implicit (5x), Explicit (2x) Solvent	Yes
HALMD	Large-scale simulations of simple and complex liquids.	Simple fluids and binary mixtures (pair potentials, high-precision NVE and NVT, dynamic correlations).	Single only
HOOMD-Blue	Particle dynamics package written grounds up for GPUs.	Written for use only on GPUs	Yes
* **HTMD**	Python environment for simulation-based molecular discovery	• Available via Conda and github • Support ACEMD, PMEMD, NAMD, GROMACS • AMBER and CHARMM force fields • Adaptive sampling, Markov State Models, visualization, protein preparation and ligand parameterization	
LAMMPS	Classical molecular dynamics package	Lennard-Jones, Gay-Berne, Tersoff, and dozens more potentials	Yes

* Indicates new application

MELD	OpenMM plugin written for GPUs	OpenMM plugin written for GPUs. Integrative approach to combine physics and information Orders of magnitude faster protein folding than brute force MD	Yes
NAMD	Designed for high-performance simulation of large molecular systems.	Full electrostatics with PME and most simulation features; 100M atom capable.	Yes
OpenMM	Library and application for molecular dynamics for HPC with GPUs.	Implicit and explicit solvent, custom forces	Yes
PolyFTS	Classical molecular simulation code for studying polymer self-assembly and thermodynamics.	Uses auxiliary fields as the fundamental simulation degrees of freedom, Uses cuFFT extensively (~ 80%), CUDA code is ~20%, Multi CPU or single GPU per job, 1x = Ivy Bridge E5-2690 CPU all 10 cores, 3-8X on K40 or K80 (utilizing 1/2 of the K80).	Single only
* **SOP-GPU**	SOP-GPU package, where SOP stands for the Self Organized Polymer Model fully implemented on a GPU, is a scientific software package designed to perform Langevin Dynamics Simulations of the mechanical or thermal unfolding, and mechanical indentation of large biomolecular systems in the experimental subsecond (millisecond-to-second) timescale.	Langevin dynamics simulations using the coarse-grained Self Organized Polymer (SOP) model, Multiple simulation trajectories can be performed simultaneously on a single GPU, Calpha and Calpha-Cbeta models are supported, Simulations of protein forced unfolding, Novel simulations of nanoindentation in silico, Support for hydrodynamic interactions, Up to ~100 ms of simulation time per day, Systems of up to 1,000,000 amino-acids (on GPUs with 6GB or great memory).	Single only

Quantum Chemistry

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Abinit	Allows to find total energy, charge density and electronic structure of systems made of electrons and nuclei within DFT.	Local Hamiltonian, non-local Hamiltonian, LOBPCG algorithm, diagonalization/ orthogonalization.	Yes
ACES III	Takes best features of parallel implementations of quantum chemistry methods for electronic structure.	Integrating scheduling GPU into SIAL programming language and SIP runtime environment.	Yes
ADF	Density Functional Theory (DFT) software package that enables first-principles electronic structure calculations.	• GGAs only, energies, forces and Hessians • ~1.5-2x faster	Yes
BigDFT	Implements density functional theory by solving the Kohn-Sham equations describing the electrons in a material.	DFT; Daubechies wavelets, part of Abinit	Yes
CASTEP [In development]	CASTEP is a leading code for calculating the properties of materials from first principles. Using density functional theory, it can simulate a wide range of properties of materials proprieties including energetics, structure at the atomic level, vibrational properties, electronic response properties etc.	TBD	Yes
CP2K	Program to perform atomistic and molecular simulations of solid state, liquid, molecular and biological systems.	DBCSR (space matrix multiply library)	Yes
GAMESS-UK	The general purpose ab initio molecular electronic structure program for performing SCF-, DFT- and MCSCF-gradient calculations.	(ss|ss) type integrals within calculations using Hartree-Fock ab initio methods and density functional theory. Supports organics and inorganics.	Yes
GAMESS-US	Computational chemistry suite used to simulate atomic and molecular electronic structure.	Libqc with Rys Quadrature Algorithm, Hartree-Fock, MP2 and CCSD.	Yes
Gaussian	Predicts energies, molecular structures, and vibrational frequencies of molecular systems.	Joint NVIDIA, PGI and Gaussian collaboration.	Yes

* Indicates new application

	GPAW	Real-space grid DFT code written in C and Python	Electrostatic poisson equation, orthonormalizing of vectors, residual minimization method (rmm-diis).	Yes
	gWL-LSMS	Materials code for investigating the effects of temperature on magnetism.	Generalized Wang-Landau method	Yes
	LATTE	Density matrix computations	CU_BLAS, SP2 Algorithm	Yes
	LSDalton	Linear-scaling HF and DFT code suitable for large molecular systems, now also with some CCSD capabilities	• (T) correction to the CCSD energy. • RI-MP2 energy/gradient (in development). • CCSD energy (in development). • GPU-based ERI generator (in development).	Yes
	MOLCAS	Methods for calculating general electronic structures in molecular systems in both ground and excited states.	CU_BLAS	Single only Additional GPU support coming in Version 8
	MOPAC2012	Semiempirical Quantum Chemistry	Pseudodiagonalization, Matrix manipulation, full diagonalization, and density matrix assembling via Magma libraries.	Single only
	NWChem	Calculations	Triples part of Reg-CCSD(T), CCSD and EOMCCSD task schedulers.	Yes
	Octopus	Used for ab initio virtual experimentation and quantum chemistry calculations.	Full GPU support for ground-state, real-time calculations; Kohn-Sham Hamiltonian, orthogonalization, subspace diagonalization, poisson solver, time propagation.	TBD
*	**ONETEP**	ONETEP (Order-N Electronic Total Energy Package) is a linear-scaling code for quantum-mechanical calculations based on density-functional theory.	• Scales to 1,000s of GPUs. • Core FFT box operations accelerated. • All features utilise these core operations but may introduce further bottlenecks resulting in lower speedups.	Yes
	PETot	First principles materials code that computes the behavior of the electron structures of materials.	Density functional theory (DFT) plane wave pseudopotential calculations.	Yes
*	**PWMat**	The fastest plane wave pseudopotential code for density functional theory simulations based on GPU.	It can perform extremely fast plane wave DFT calculations based on GPU machines and single precision and double precision mixed algorithm. It deploys the state-of-the-art electronic structure calculation methods with many new features and algorithm innovations. It performs ab initio material science simulations, designed for both theoretical and experimental groups.	Yes
	Q-CHEM	Computational chemistry package designed for HPC clusters.	Various features including RI-MP2	Single Only
*	**QMCPACK**	Solves the many-body Schrodinger equation for electronic structures using a quantum Monte Carlo method.	Main features	Yes
*	**Quantum Espresso/ PWscf**	An integrated suite of computer codes for electronic structure calculations and materials modeling at the nanoscale.	PWscf package: linear algebra (matix multiply), explicit computational kernels, 3D FFTs.	Yes
	QUICK	QUICK is a GPU-enabled ab intio quantum chemistry software package.	Running Hartree-Fock and DFT energy on GPU, Supports s, p, d, f orbitals on energy calculation, HF gradient with s,p,d orbital support, GPU-based ERI generator.	Yes
	TeraChem	Quantum chemistry software designed to run on NVIDIA GPU.	Full GPU-based solution; Performance compared to GAMESS CPU version.	Yes

* Indicates new application

*	**VASP**	Complex package for performing ab-initio quantum-mechanical molecular dynamics (MD) simulations using pseudopotentials or the projector-augmented wave method and a plane wave basis set.	Hybrid Hartree-Fock DFT functionals including exact exchange.	Yes

Visualization and Docking

	APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
	Amira®	A multifaceted software platform for visualizing, manipulating, and understanding Life Science and bio-medical data.	3D visualization of volumetric data and surfaces	Single only
	BINDSURF	A virtual screening methodology that uses GPUs to determine protein binding sites.	Allows fast processing of large ligand databases	Single only
	BUDE	Molecular docking program	Empirical Free Energy Force field	Single only
*	**Core Hopping**	Schrödinger's Core Hopping program not only provides the traditional ligand-based methods for exploring different scaffolds, but also offers a receptor-based method that will accurately account for detailed ligand-receptor interactions of compounds containing novel cores.	GPU accelerated Application	TBA
	FastROCS	Molecule shape comparison application	Real-time shape similarity searching/ comparison	Yes
	Interactive Molecule Visualizer	Experimental interactive molecule visualizer based on a ray-tracing engine.	Targeting high quality images and ease of interaction, IMV uses the latest GPUcomputing acceleration techniques, combined with natural user interfaces such as Kinect and Wiimotes.	Single only
	Molegro Virtual Docker 6	Method for performing high accuracy flexible molecular docking.	Energy grid computation, pose evaluation and guided differential evolution.	Single only
*	**PaPaRa 2.0**	A Vectorized Algorithm for Probabilistic Phylogeny-Aware Alignment Extension.	Up to 15-fold run time improvements by deploying SIMD vector intrinsics to accelerate the alignment kernel.	Single only
	PIPER Protein Docking	Protein-protein docking program	Molecule docking	TBD
	PyMol	User-sponsored molecular visualization system on an open-source foundation	Increased real-time rendering performance. Lines: 460% increase Cartoons: 1246% increase Surface: 1746% increase Spheres: 753% increase Ribbon: 426% increase	Single only
	VEGA ZZ	Molecular Modeling Toolkit	Virtual logP, molecular surface values	Single only
	VMD	Visualization and analyzing large bio-molecular systems in 3-D graphics	High quality rendering, large structures (100M atoms), analysis and visualization tasks, multiple GPU support for display of molecular orbitals	Yes

NUMERICAL ANALYTICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
Accelereyes- ArrayFire	Comprehensive GPU function library	Hundreds of functions for math, signal/ image processing, statistics, and more. Available for C, C++, Fortran, and other languages	Yes
HiPLAR	3High Performance Linear Algebra in R	Supports GPU and multi-core platforms, compatible with legacy R code, no new data types or operators, auto-tuning, support for R Matrix package.	Yes (for algebra functions via Magma 1.5 or later)
Mathematica Wolfram	A symbolic technical computing language and development environment.	Development environment for CUDA and OpenCL. GPU acceleration for Wolfram Finance Platform.	Yes

* Indicates new application

*	**Mathworks - MATLAB**	GPU acceleration for MATLAB (high-level technical computing language).	Support for 200+ of most used MATLAB functions (incl. Signal Processing, Image Processing, Communications Systems, etc).	Yes
	NMath Premium	GPU-accelerated math and statistics for .NET, automatically detects the presence of a CUDA-enabled GPU at runtime and seamlessly redirects appropriate computations to it.	Automatically offloads computations to the GPU.	Single only

PHYSICS

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
AWP	The Anelastic Wave Propagation, AWP-ODC, independently simulates the dynamic rupture and wave propagation that occurs during an earthquake. Dynamic rupture produces friction, traction, slip, and slip rate information on the fault. The moment function is constructed from this fault data and used to initialize wave propagation.	3D Finite Difference Computation	Single only
BQCD	Lattice quantum chromodynamics application, used for nuclear ad high energy physics calculations.	Wilson-clover fermion linear solver	Yes
CASTRO	A multicomponent compressible hydrodynamic code for astrophysical flows including self-gravity, nuclear reactions and radiation. CASTRO uses an Eulerian grid and incorporates adaptive mesh refinement (AMR). The approach uses a nested hierarchy of logically-rectangular grids with simultaneous refinement in both space and time.	Gravitational Field Solver	Yes
Changa	Astrophysics code performs collisionless N-body simulations. It can perform cosmological simulations with periodic boundary conditions in comoving coordinates or simulations of isolated stellar systems.	Gravitational Model has been accelerated using CUDA	Single only
Chemora	Chemora is a system for performing simulations of systems described by differential equations running on accelerated computational clusters.	Chemora embeds the equations' computational kernels into dynamically compiled loop nests shaped for input size and GPU structure.	Yes
Chroma	Lattice Quantum Chromodynamics (LQCD)	Wilson-clover fermions, Krylov solvers, Domain-decomposition	Yes
CPS	Lattice quantum chromodynamics application, used for nuclear ad high energy physics calculations.	Wilson, domain-wall and Möbius fermion linear solvers	Yes
*	**CST STUDIO SUITE® and CST PARTICLE STUDIO®**	Self-consistent simulation of charged particles in electromagnetic fields.	Particle-in-Cell Solver	Yes
ENZO	3D block-structured AMR code for cosmological structure formation.	Accelerated magneto hydrodynamics solvers	Yes
GTC	Simulates microturbulence and transport in magnetically confined fusion plasma.	Electron push and shift (accounting for >80% of run time)	Yes
GTC-P	A development code for optimization of plasma physics. Full science and data sets are included, but in a simplified form to allow performance testing and tuning.	Optimized with CUDA. OpenACC development underway	Yes
GTS	Simulates microturbulence and the motion of charged particles and interactions in fusion plasma.	Push and shift for both electron and ion dynamics	Yes
HACC	Simulates N-Body Astrophysics	This code has been optimized with CUDA runs in full production mode.	Yes

* Indicates new application

MAESTRO	A low Mach number stellar hydrodynamics code that can be used to simulate long-time, low-speed flows that would be prohibitively expensive to model using traditional compressible code.	Gravitational Field Solver	Yes
MILC	Lattice Quantum Chromodynamics (LQCD) codes simulate how elemental particles are formed and bound by the "strong force" to create larger particles like protons and neutrons.	Staggered fermions, Krylov solvers, Gauge-link fattening.	Yes
OSIRIS	Simulates Plasma Physics including Laser interaction	2 dimensions of the particle push have been optimized with CUDA. Additional optimization is being planned with OpenACC.	Yes
PIConGPU	A relativistic Particle-in-Cell code that describes the dynamics of a plasma by computing the motion of electrons and ions subject to the Maxwell-Vlasov equation.	Simulation of laser-wakefield acceleration of electrons.	Yes
PPM	Piecewise parabolic method, a higher-order extension of Godunov's method which uses spatial interpolation and allows for a steeper representation of discontinuities, particularly contact discontinuities.	Turbulent, compressible mixing of gases in the context of stars near the ends of their lives and also in inertial confinement fusion.	Single only
QUDA	Library for Lattice QCD calculations using GPUs.	CUDA supports the following fermion formulations: Wilson,Wilson-clover,Twisted mass,Improved staggered (asqtad or HISQ) and Domain wall.	Yes
RAMSES	Simulates astrophysical problems on different scales (e.g. star formation, galaxy dynamics, cosmological structure formation).	CUDA acceleration is applied for radiative transfer for reionization, and the hydrodynamic solver using AMR.	Yes
XGC	Simulates edge effects for MHD plasma physics	The particle push portion has been optimized with CUDA and is being fully optimized with OpenACC and CUDA.	Yes

SCIENTIFIC VISUALIZATION

APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
3D Slicer	Medical visualization & segmentation	Rendering, image processing	Single only
CEI EnSight	Visualization and analysis application for CAE	Rendering	Yes
FluoRender (SCI, U of Utah)	Interactive rendering tool for confocal microscopy data visualization.	Multi-channel volume rendering	Single only
GPULib for IDL	Data analysis application	Analysis tasks	Single only
* **GVDB**	GPU framework for OpenVDB data structures that integrates with OptiX	Volumetric rendering of 3D voxels for full volume rendering, hole filling, and user defined operations.	Single Only
HVR (LCSE, U of Minnesota)	Interactive volume rendering application	Volume rendering	Yes
ImageVis3D (SCI, U of Utah)	Simple, scalable, and interactive volume rendering application.	Out-of-core volume rendering	Single only
* **IndeX**	Interactive or real-time volumetric visualization	Parallel distributed 3D rendering of dense or sparse volumes. Accurate ray casting or ray tracing at high resolution of full size datasets. Plug-in to ParaView also available.	Yes
IntelligentLight FieldView	Visualization application for CFD	Rendering	Single only
MathWorks - MATLAB	Data analysis and visualization application	Rendering and analysis tasks	Single only
ParaView	Scalable data anlysis and visualization application	Rendering and analysis tasks	Yes
Seg3D (SCI, U of Utah)	Segmentation application for medical data	Rendering, image processing	Single only

* Indicates new application

*	**OptiX**	OptiX API is framework for high-performance ray tracing.	Programmable intersection, ray generation, shading, data payloads.	Yes
	Visulalization Toolkit (VTK)	Data anlysis and visualization toolkit	Rendering	Single only
	VisIt	Scalable data anlysis and visualization application	Rendering and analysis tasks	Yes
	vl3 (Argonne National Lab)	Large dataset visualization in cosmology, astrophysics, and biosciences fields.	Volume rendering of particles	Yes
	VMD (U of Illionis, Urbana-Champaign)	Visualization and analysis of large bio-molecular systems in 3-D graphics.	High-qulity rendering, large structures (100M atoms), analysis and visualization tasks, multiple GPU support for display of molecular orbitals.	Yes

Safety & Security

	APPLICATION	DESCRIPTION	SUPPORTED FEATURES	MULTI-GPU SUPPORT
	Cognika - Perseus	Real-Time Alerting and Visual Search for Fixed and PTZ Cameras.	Real-Time alerting on humans or vehicles; Content-based image search on humans or vehicles.	Yes
	Genetec – Security Center 5.3	GPU accelerated decode & rendering enables the display of more high-resolution streams from a single workstation, as well as enhancing video playback performance.	Offloads the workload of video stream decode and display rendering of multiple streams to GPU.	Single only
*	**Giant Gray – Graydient V (Video)**	Machine learning anomaly detection for enhanced video analytics.	Proactive event detection and real-time alerts for safety, unauthorized access prevention, and loss prevention. 24/7 real-time analysis and alerting scaling to thousands of video streams across remote and geographically dispersed locations.	Yes
	Herta Security - BioSurveillance NEXT, BioFinder	Real time facial recognition and forensic alerts against multiple watchlists.	Supports crowded scenes, difficult lighting, faster than real-time analysis, partial face concealment.	Yes
	iCetana - iMotionFocus	Intelligent analysis of video on 1,000+ camera streams to significantly filter and reduce the camera streams requiring an operator view.	GPU accelerated machine learning to identify abnormal activity within video streams	Yes
	intuVision - intuVision VA	Real-time alerts and data reporting from use cases include Security, Traffic, Retail and Parking, Analysis of video streams in real-time and on archived video at up to 20x real-time speeds.	Robust and user trainable object classification for tracking. Using distributed architecture	Yes
	IQrity Inc. - IQrity RTFace -300/600, IQrity LDFace - 800	Deep Learning facial recognition SDK with 25 bytes template for real-time identification applications and large-scale IdM solutions.	Real-time face detection, verification or suspect identification against multi-million datasets based on an artificial neural network.	Yes
	Macroscop	Open-platform video management software for scalable IP video surveillance systems with advanced video analytics.	H264 decoding for CPU offload, zooming, image conversion shader from 24 to 32 bits delivering better color combination.	Yes
	Mi-AccLib	Accelerated library for video analysis on video surveillance.	Accelerated Intrusion Detection Algorithm.	Yes
	MotionDSP - Ikena Forensic, Ikena Spotlight	Real-time (render-less) super-resolution-based video enhancement and redaction software for forensic analysts and law enforcement professionals	Multi-filter, render-less video reconstruction (super-resolution, stabilization, light/color correction), and automatic tracking for redaction video from body cameras, CCTV and other sources.	Yes
	NEC NeoFace® Watch	Face recognition for real-time video surveillance and offline search compared against multiple watch-lists.	Detects & recognizes multiple faces simultaneously in crowds and variable lighting, scales to more cameras, larger face databases.	Yes

* Indicates new application

	Nervve - Visual Search Solution (NVSS)	High speed visual search and analysis	Uses images instead of keywords to search for objects or scenes of interest within video and imagery. Reliant solely on pixel data with no training, keywords, or tags required.	Yes
	Network Optix - Nx Witness	IP video management system designed for auto discovering, managing, recording, analyzing and searching thousands of video streams at the same time.	GPU accelerated conversion of YUV images to RGB, drawing and scaling YUV images in desktop client, dewarping fisheye (circular or panamorph) live or recorded video streams	Yes
*	**OpenALPR**	Automatic license plate recognition software applied to video streams from IP cameras.	high accuracy license plate character recognition spanning North America, Europe, United Kingdom, Australia, Korea, Singapore and Brazil. APIs and source code available for embedded applications and web services.	Yes
	Smilart Platform	Real-time face recognition in cooperative and uncooperative scenarios adaptable for a multitude of applications to detect, identify or verify people and objects.	Critical core segments written in CUDA allowing for unlimited parallelization and transparent clustering.	Yes
*	**VOCORD FaceControl**	Detects and recognizes the faces of people, freely passing-by cameras, providing an instant alert to people on a watchlist, recognizes age and gender, counts people by faces, tags newcomers and regular visitors. The system uses deep neural network algorithms and performs recognition with extremely high accuracy in field applications.	Non-cooperative biometrical facial recognition system, operating "on-the-go".	Yes

For more information on GPU-accelerated applications please visit, **www.nvidia.com/teslaapps**

* Indicates new application